

VIDEOGRAPH

GENERAL SPECIFICATIONS

PRINTER/PLOTTER MODEL 9041

A·B·DICK ® COPYING/DUPLICATING PRODUCTS • ELECTRONIC DATA PRESENTATION

VIDEOGRAPH
GENERAL SPECIFICATIONS

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A. B. DICK VIDEOGRAPH
MODEL 9041
PRINTER/PLOTTER

GENERAL SPECIFICATIONS

1.0 FUNCTIONAL DESCRIPTION

The Model 9041 Videograph Printer/Plotter (Figure 1) is a high-speed, dual-purpose device designed for quick-look presentation of alphanumeric characters and symbols, or several plotted-point curves, by electrostatic printout on a moving web of Videograph paper. Image printout, development, and fixing are automatically performed under room light conditions as the paper web moves through the printer. The high contrast copy is delivered dry and ready for use.

In conjunction with a companion control unit (such as the Model 9403 Printer/Plotter Control Unit, manufactured by A. B. Dick Company), the 9041 printer accepts "machine language" codes from a variety of data acquisition or data processing systems. The control unit and printer translate the codes into visual "human language", and/or graphs, printed out in hard-copy form. The Videograph copy is produced on paper, either 8-1/2 or 11" wide, with a nominal 8-1/2 inch writing line and can be delivered in a continuous roll (approx. 1500 ft. long) or cut into page lengths at the option of the operator. The receiving tray will accept a maximum cut-off length of 17" for cut-page delivery.

When delivered, the copy is complete and ready for use without further processing. The Videograph paper and fixed image are of archival grade and comparable, in contrast and permanence, to black-on-white copies produced on standard manual typewriters. Videograph paper is finished with a dull surface to minimize glare and to furnish a writing surface which easily accepts notations made with lead pencil, colored pencils, and pen-and-ink.

The entire Videograph process, from printout to fixing, is completely compatible with the operating environment of conventional computers.

2.0 DATA SYSTEM COMPATIBILITY

The Model 9041 is a demand-type printer requiring a suitable printer/plotter control unit (PPCU) between the printer and data source (direct acquisition system or computer tape unit). Videograph control units are available from A. B. Dick Company to furnish control logic as commands to the printer and to control data flow at the proper level, rate and program order.

These control units provide compatibility of the Model 9041 Printer/Plotter with any conventional digital data system. A diagram showing typical inter-relation of data sources, control unit, and the 9041 Printer/Plotter is shown in Figure 2.

FIGURE 1

A. B. DICK MODEL 9041 VIDEOGRAPH PRINTER/PLOTTER

External Configuration

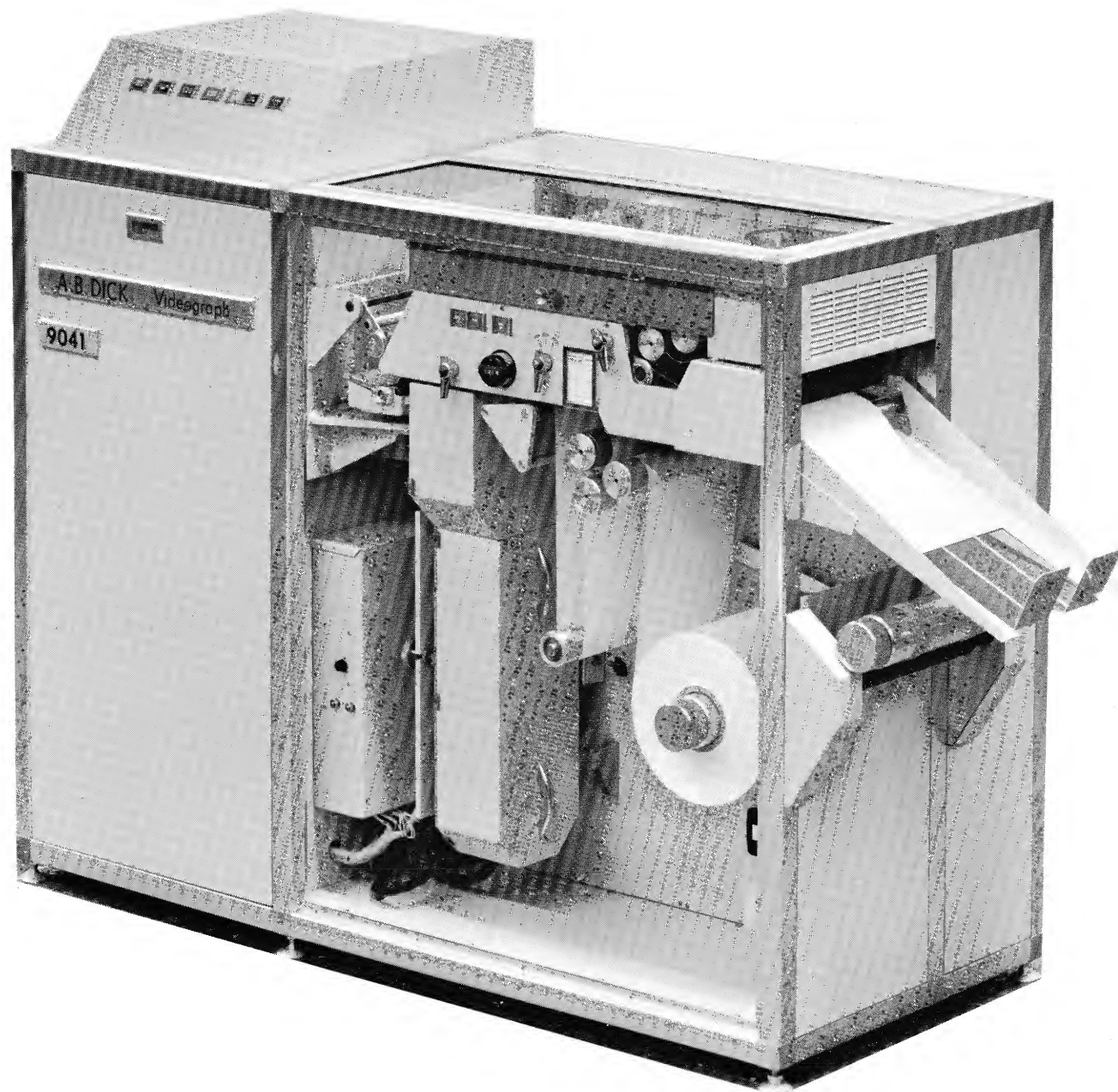
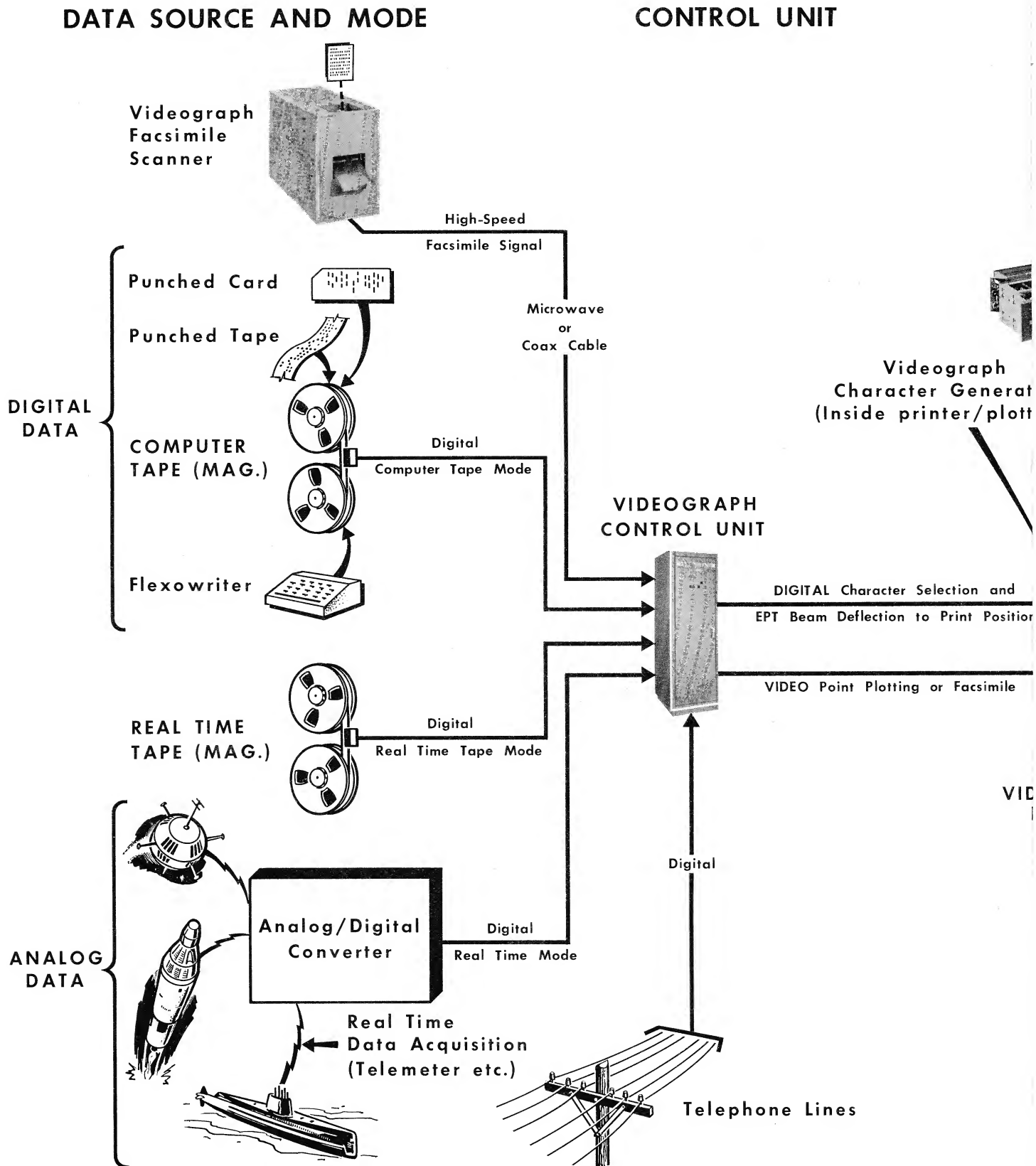


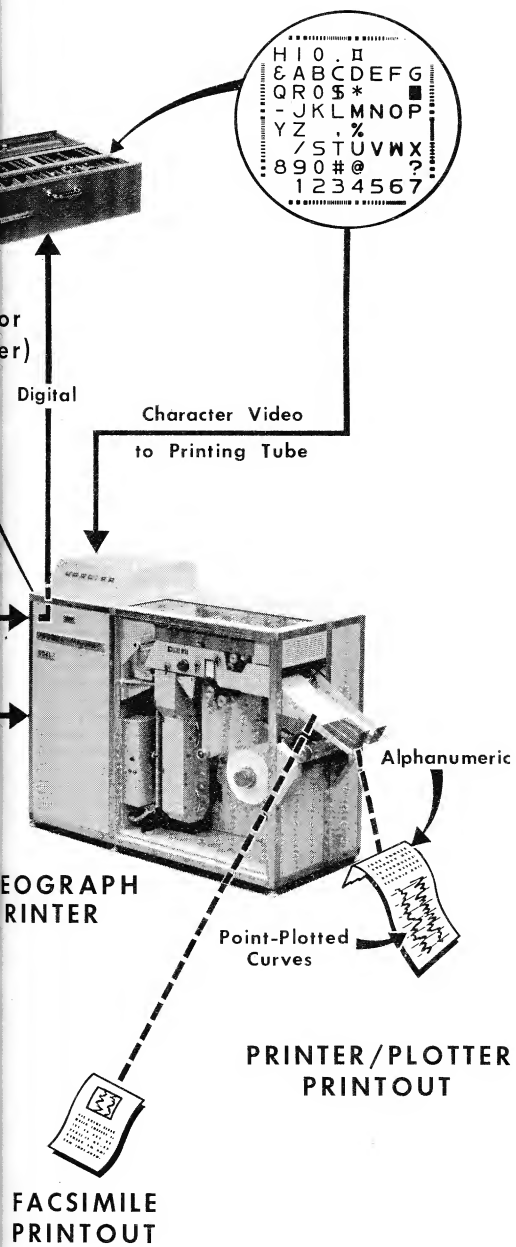
FIGURE 2

TYPICAL SYSTEM CAPABILITIES WITH MODEL 9041 PRINTER/PLOT



TER

PRINTER PLOTTER



3.0 PRINTER/PLOTTER COMPONENT FUNCTIONAL ARRANGEMENT

Figure 3 shows the functional arrangement of the components within the aluminum-frame structure. The compartment at the left houses the power supplies, rack-mounted Videograph character generator, and associated circuit elements. The inclined main control panel is above the electronics compartment.

The bay at the right contains the supply paper, paper drive, electrostatic printing tube, developer-fixer, and the paper cut-off sections. The receiving tray for cut pages, and the take-up reel for continuous-roll delivery, are mounted just outside the main frame at the right end. A paper-drive motor, variable speed transmission, and developer-supply system are mounted behind the vertical panel in the bay. Access is through doors at the rear.

Paper is pulled from a brake-controlled supply roll by the primary drive rolls. The supply roll spindle is mechanically and automatically controlled by the position of the web-tension control elevator, which maintains a constant web tension. This maintains a loop in the web to allow for sudden take-up when the primary drive rolls accelerate the web. From the loop, the web is pulled across the printing tube (EPT) where the latent electrostatic image is formed on the Videograph paper by the action of an electron beam scanning a wire matrix in contact with the paper. (For more complete details on the printing process, see the following paragraph, "Videograph Principle.")

The latent image is developed as the web is transported through the liquid developer rollers and is dried and fixed by a heat lamp located in an air stream at the top of the bay. During image fixing, the web moves under a glass window for viewing, then moves through the cut-off unit, where it may be cut for tray delivery, or it may pass on to the take-up reel for rewinding.

A paper feeler, in contact with the supply roll, senses the diminishing roll diameter as the paper pays out, and lights a "paper low" signal lamp when 100 feet of paper remains. If the supply dwindles to approximately 25 feet, the feeler stops the paper drive and data input functions.

4.0 VIDEOGRAPH PRINCIPLE

The Videograph principle as applied to the Model 9041 Printer/Plotter includes character generation by a self-contained sub-assembly, electrostatic printing on Videograph paper, and developing plus fixing of the image.

4.1 CHARACTER GENERATION

The A. B. Dick Model 980 Character Generator is provided in the printer/plotter to translate the digital codes of the input lines into the alphanumeric characters or symbols of the target in the monoscope cathode-ray tube shown in Figure 4.

The target contains characters arranged in vertical columns and horizontal rows of eight character windows ($8 \times 8 = 64$) to provide 64 character positions. The character selection input (six lines) is binary coded to direct (position) the beam to any one of the windows. For example code 000, 111 would index the beam to the number 7 shown in the lower right target window

FIGURE 3

A. B. DICK MODEL 9041 VIDEOGRAPH PRINTER/PLOTTER

Functional Arrangement

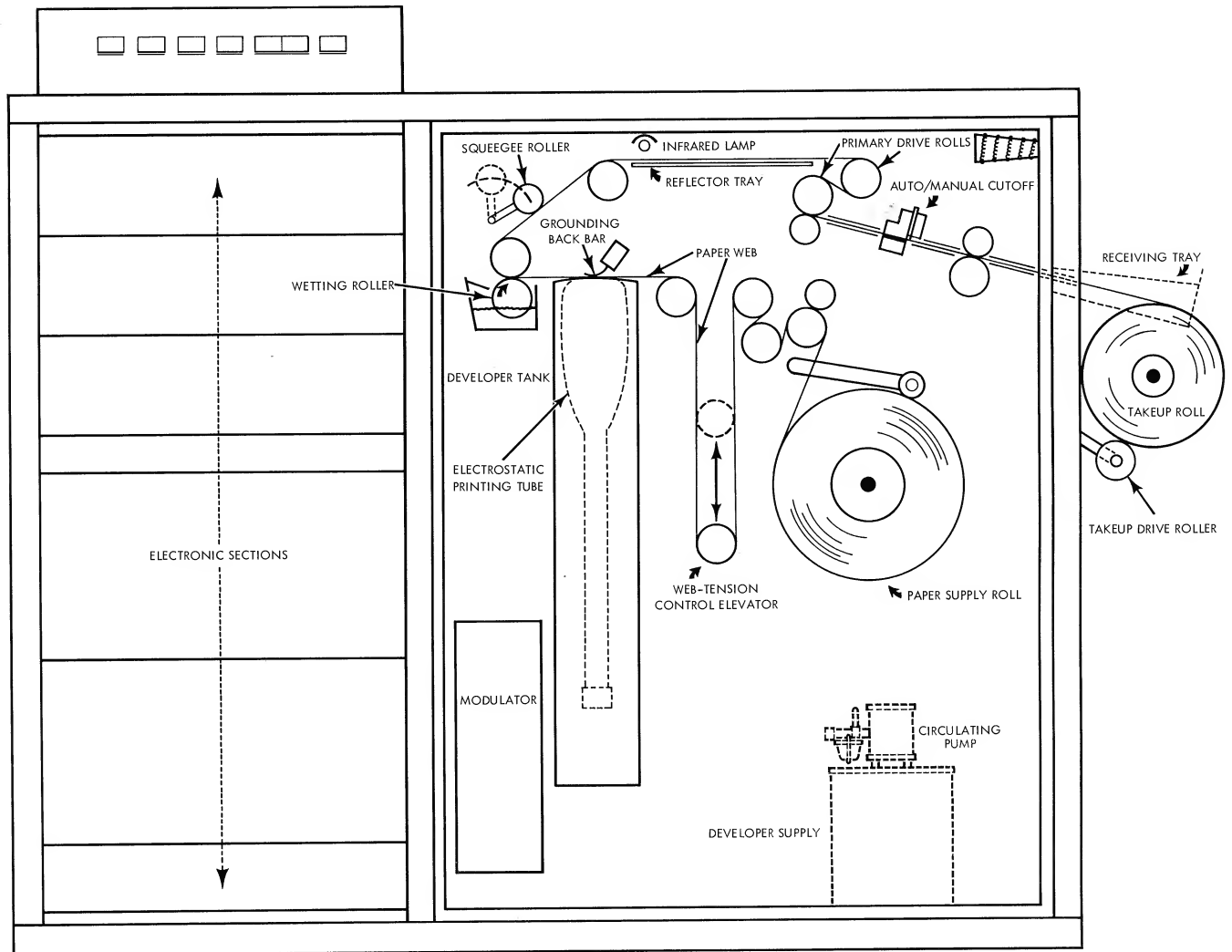
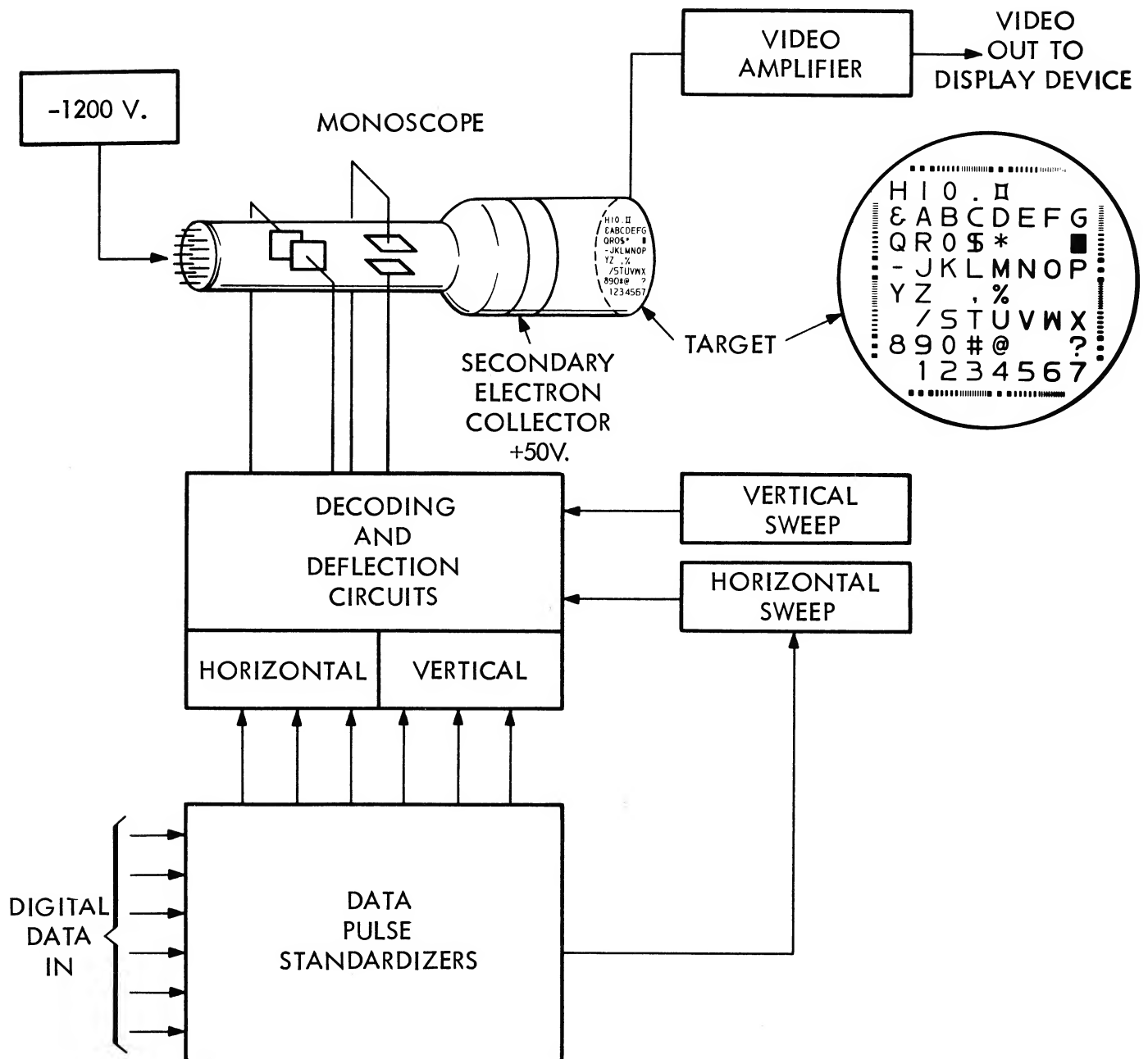


FIGURE 4
MONOSCOPE CHARACTER GENERATOR
Simplified Block Diagram



(Figure 4). The first three digits of the code are all zeros indicating vertical deflection to row #0. The last three digits (111) are the binary equivalent of decimal 7, and they deflect the beam to column #7 which is the eighth column, counting from column #0 (lower left corner).

As soon as the character selection code is sampled, the beam is turned on and begins scanning the character with a small raster. As the constant-intensity beam strikes the alternate bright and dark spots of the black character on the target, the target current through a load resistor varies accordingly and develops a video signal. This signal is amplified, processed, and used to intensity modulate (turn on and off) an electron beam in the electrostatic printing tube. This EPT beam is locked in step with the motion of the scanning beam in the character generator and duplicates the character scanning motion as the beam turns on (to print a black point) and off (for no print).

4.2 VIDEOGRAPH ELECTROSTATIC PRINTING

Printing is accomplished by sweeping the electron beam in the Videograph electrostatic printing tube across the inner ends of a fine wire matrix whose outer ends contact the moving paper (Figure 6). The beam sweep is in unison with the electron beam which scans the selected target character in the character generator. As the scanning beam strikes a dark portion of the character, the printing beam turns on and strikes a portion of the wire matrix in a duplication of the character pattern. These wires deposit a charge on the coated surface of the Videograph paper. This charge, in the shape of the character, forms the latent image.

As the image is printed out, the moving paper passes into the liquid developer section where a toner (dyed resin) suspended in a carrier is attracted to the charged latent image. Only the toner is attracted and the carrier is squeegeed off into the developer tray. The web then passes into the drying and fixing compartment where a heating unit and air stream fix the image. The air carries off vapors from the process through the exhaust opening in the printer cabinet and assists the heat-drying process.

5.0 OPERATING CHARACTERISTICS

5.1 TYPICAL HARD-COPY OUTPUT -- REAL-TIME MODE

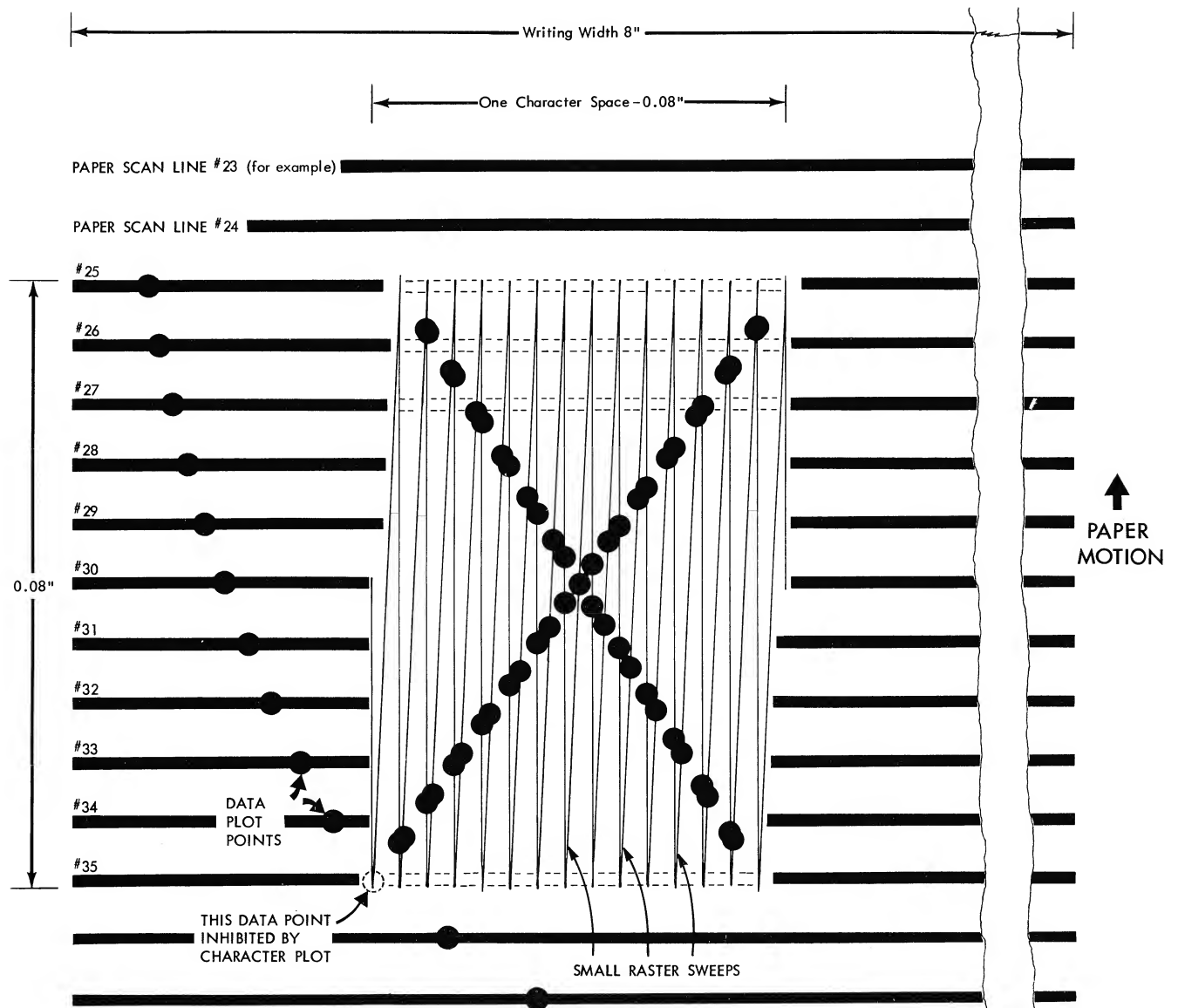
Figure 7 is an example of a typical hard-copy record of real-time data acquired directly from telemetry signals (with the printer/plotter operating "on-line") or from magnetic tape playback of a tape made simultaneously with acquisition of the telemetry signals. Each function, identified in the margin by A, B, C etc., is controlled by the control unit (PPCU) -- usually by patch-panel instruction. The functions below are typical. Other functions can be accomplished if provided for in the design of a particular control unit.

A. RANGE TIME GENERATION

Range time printout is obtainable at various intervals; typically 0.1, 1.0 or 10 seconds. The four digit number usually represents time in tenths of seconds.

FIGURE 5

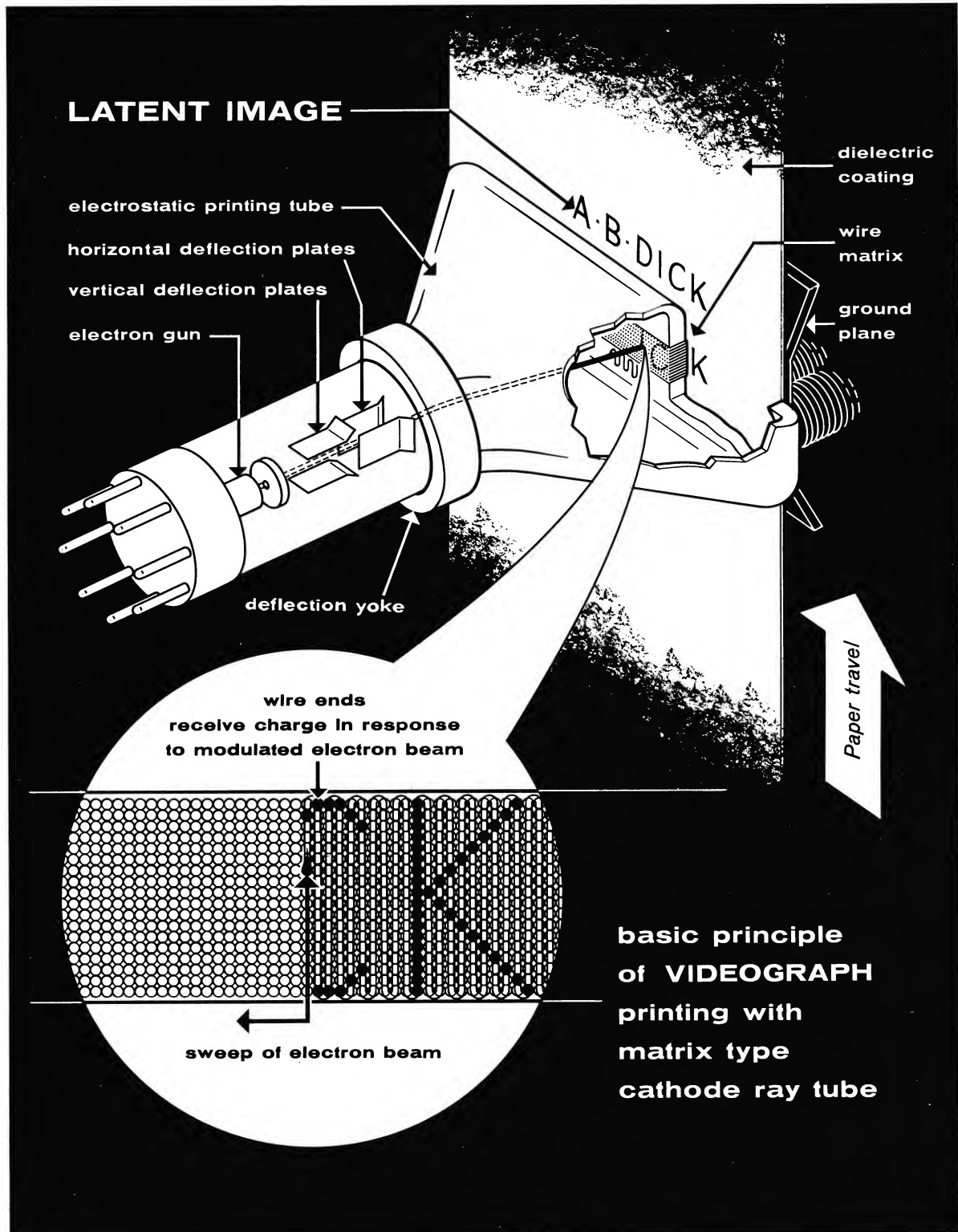
Sketch Showing Formation of Character "X"
by Monoscope Character Generator and Effect of Curve
Plotted Through Same Region



FORMATION OF CHARACTER "X"
BY MONOSCOPE CHARACTER GENERATOR AND
EFFECT OF CURVE PLOTTED THROUGH SAME REGION

FIGURE 6

BASIC PRINCIPLE OF VIDEOGRAPH PRINTING
WITH MATRIX TYPE CATHODE-RAY TUBE



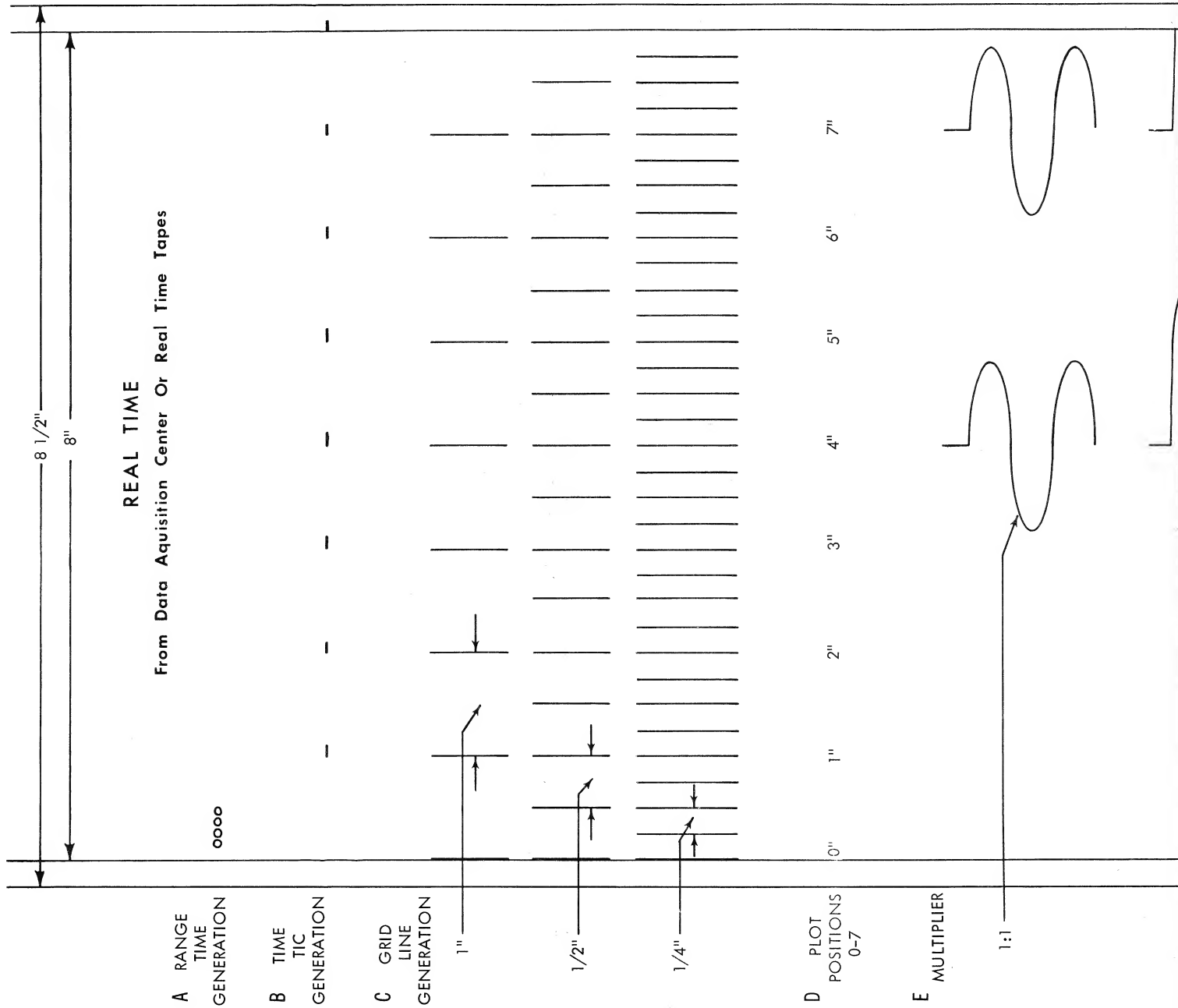
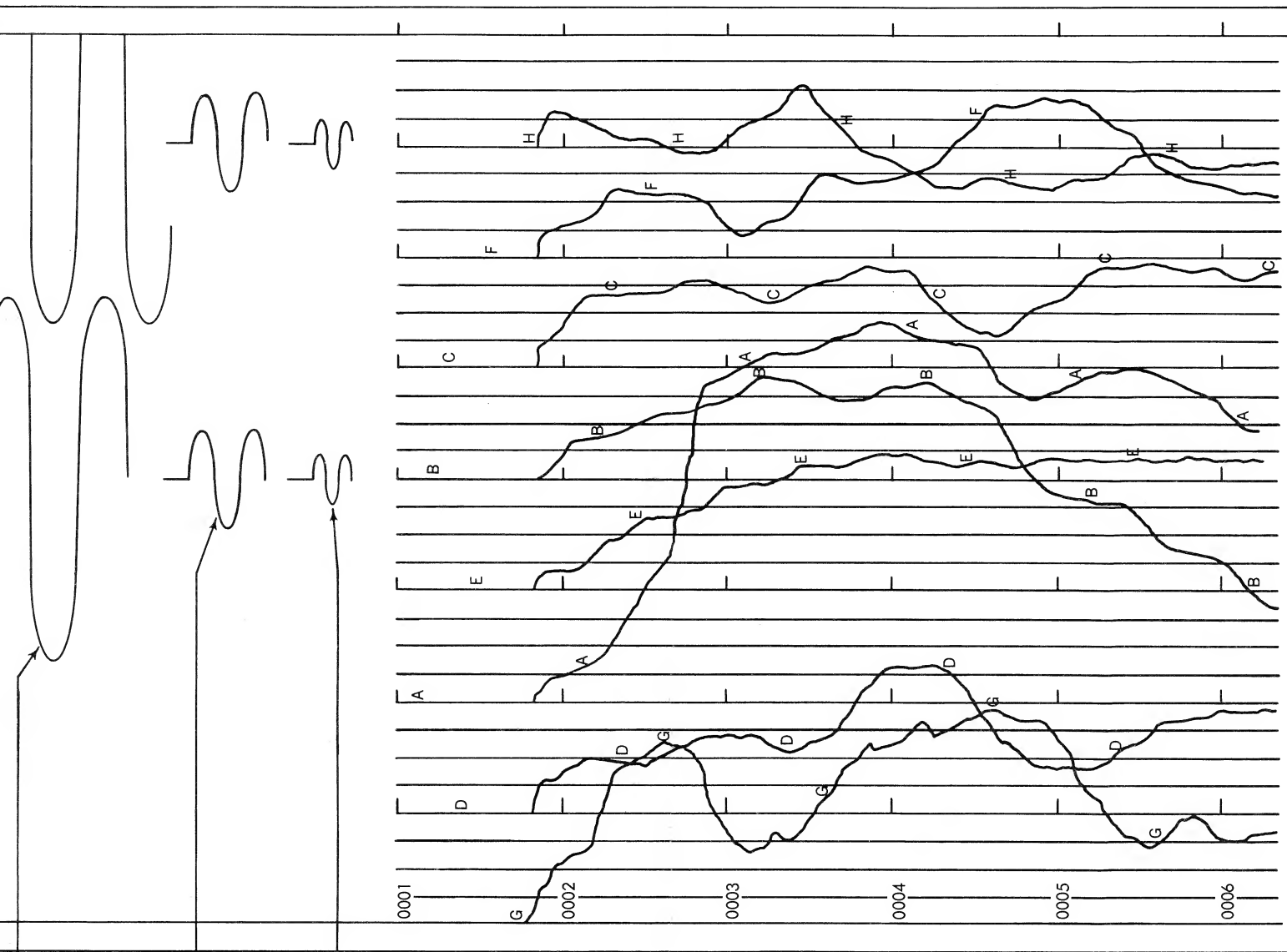


FIGURE 7

MODE HARD-COPY OUTPUT



F
PLOTS
A THRU H

REAL-TIME MODE HARD-COPY OUTPUT

B. TIME-TIC GENERATION

Time-tic dashes are printed in conjunction with each range time readout. The dashes are approximately .1" long and spaced at 1 inch intervals across the printed field.

C. GRID LINE GENERATION

In this application, plotting point locations, which are usually multiples of 32, 64, or 128 increments, can be intensified periodically in order to generate vertical grid lines having nominal separations of 1/4", 1/2" or 1".

D. PLOT POSITION

The zero amplitude position of any plotting channel can be located nominally at 0", 1", 2", 3", 4", 5", 6", or 7" from the left edge of the plotting field. If printout at the 0" position is selected, increment #1023 will be the righthand limit for plotted points.

E. PLOT MULTIPLIERS

The values of data in any of the selected plotting channels can be multiplied by factors of 2, 1, 1/2, or 1/4 before being plotted.

F. PLOT CHANNEL SELECTION AND TAGGING

The input data for point plotting is assigned to printing traces (typically, 8 channels identified as A through H). If desired, each trace can utilize the full 1024-increment width to show changes in amplitude. Each trace is labeled with its corresponding character (A, B, C-H) within the vertical intervals bounded by the range-time tics.

5.1.1 POINT-PLOTTING AND LABELING RATE

Practical considerations usually dictate the use of a rate of about 66,000 points per second (15 microseconds per point). Character printing next to a trace can be accomplished at the rate of 15,625 characters per second. Rate characteristics are listed in Table I.

5.2 TYPICAL HARD-COPY OUTPUT -- COMPUTER TAPE MODE

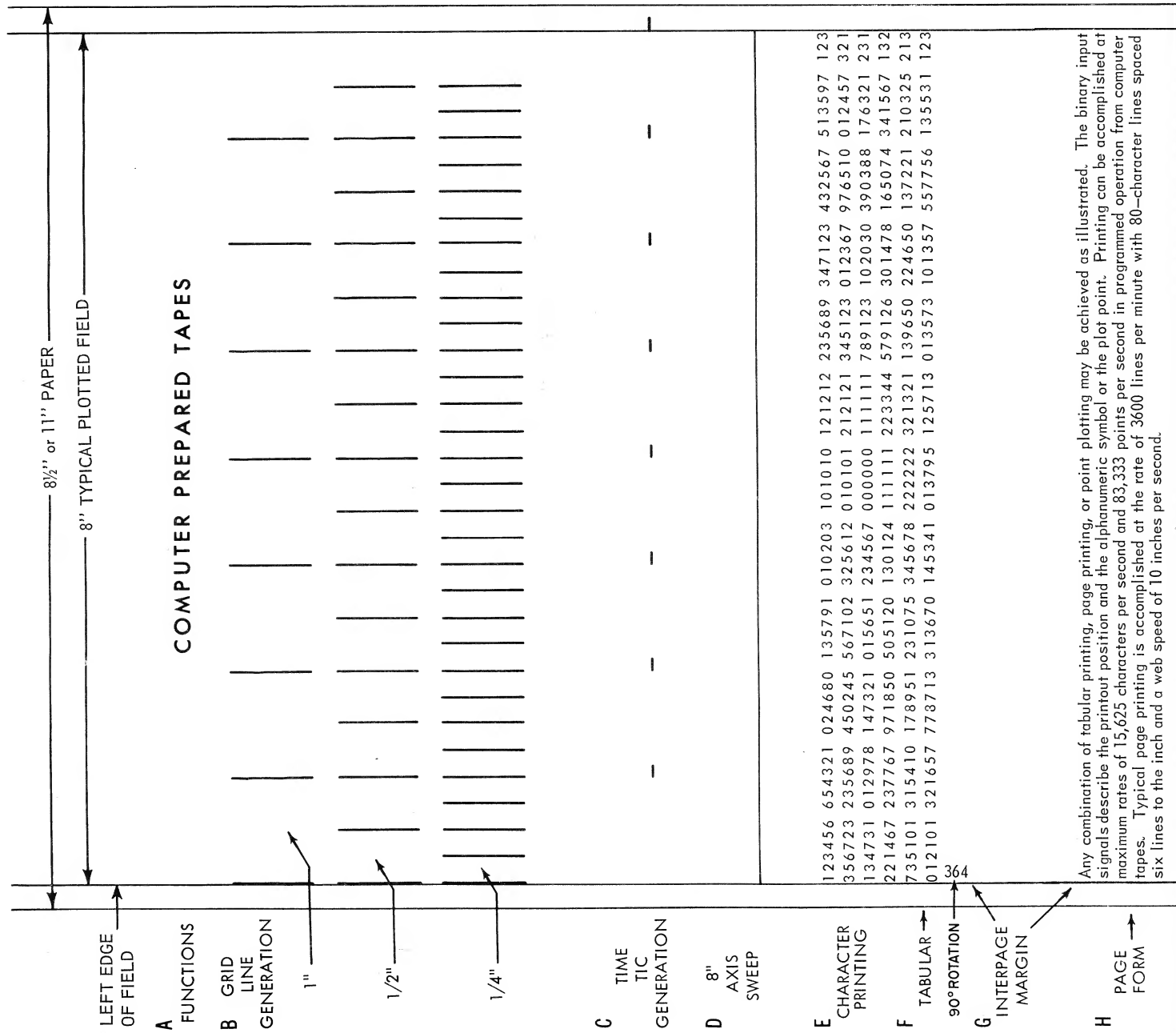
Figure 8 is an example of a typical hard-copy record of data reduction from magnetic tape programmed and prepared by a computer. This example is typical of the output when an IBM 729 IV Magnetic Tape Unit reads out the program data and transmits it to the printer/plotter control unit. The functions shown are automatically generated by a command code programmed on the computer tape.

TABLE I

PRINTER/PLOTTER FUNCTION TIME CYCLES

1. Character-selection, positioning and printing require a minimum of 64 μ seconds.
2. Plot Point-positioning and printing requires a practical minimum of 12 μ seconds.
3. Grid-line positioning and printing of the complete series requires approximately 265 μ seconds.
4. Time-Tic positioning and printing of the complete series requires approximately 265 μ seconds.
5. Axis Sweep, (drawing a horizontal line across the paper) 8-1/2" printing, requires approximately 265 μ seconds.
6. Paper Speed - 0.1 to 10 inches/second in two ranges.

(NOTE: The time periods cited in items 1 through 5 include a 10- μ second period for deflect-the beam to starting position, for deflection yoke settling, and adequate guard time.)



erft dftw rertom oxtob o zo bezu ed of zi tuotniq neww JACEJCEVJZJ QEEJWZ DIA JEI JAJAHJ to elqmdxe no zi zini i .tepq oxtob erft no gnitoo erft dftw ttoitoc ni egami

CHARACTER
AND SWEEP
REVERSAL

TYPICAL
OUTPUT



PAPER
TRAVEL

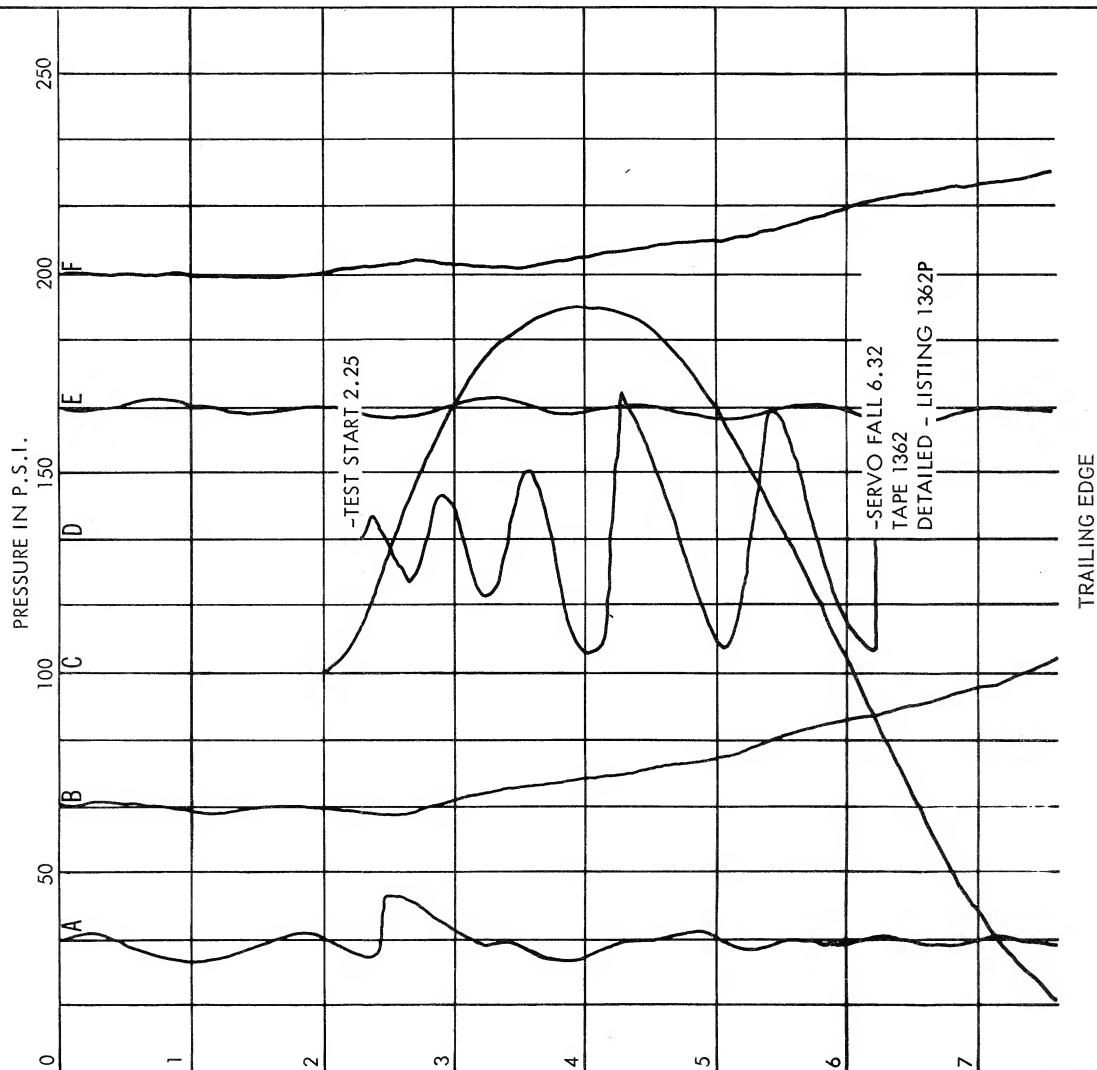
Minuteman Test Number 12345 Pacific Missile Range, 1 Jan. 63

Weather Conditions:

Wind 15.5 MPH
Visibility 5.0 Miles
Temperature 68.5 F
Barometer 29.9

Pertinent data available in the following documents:

AF300-23-23 AF2300-23-24
STL987654 STL987655
BMD85.43.1 BMD85.43.2
PMR34-34-34 PMR34-34-35



COMPUTER-TAPE MODE HARD-COPY OUTPUT

5.3 PRINTER/PLOTTER SIGNAL REQUIREMENTS

Function time cycles are given in Table I. Input-output signal characteristics are listed in Table II and shown on the interface diagram, Figure 9.

5.4 PAPER DRIVE

5.4.1 WEB SPEED SELECTION AND ACCURACY

Any paper web speed, within a range of 0.1-0 to 10-inches per second, can be selected at the auxiliary control panel in the printer/plotter. Selection is made with a Speed Range Control (low-off-high) and a Speed Selector Dial, to vary the speed within the range. A desired speed can be selected to an accuracy of $\pm 1\%$.

At any selected speed, short term variations ("wow and flutter") in that speed will not produce variations in position of plotted points along the chart in excess of $\pm 0.030"$. In addition, no deviations exceeding 0.015" will occur within any selected 1-inch interval.

5.4.2 PAPER DRIVE CONTROL

With the printer switched to automatic (on the auxiliary control panel), a PAPER RUN signal from the control unit will initiate paper drive at the pre-selected speed. (*A signal can be made available within the printer/plotter which will indicate the selected speed to the control unit, if desired.)

Manual control of the paper drive can be selected at the printer/plotter by a push button on the auxiliary control panel. In the manual mode, paper drive can be initiated with the PAPER FEED push button on the same panel.

5.5 PLOTTING RATE, ACCURACY, AND STABILITY

5.5.1 RATE

Points can be plotted at a maximum rate of 83,333 points per second, based on a 12 microsecond cycle for deflection level change, minimum video signal width for printout, and adequate guard time.

5.5.2 CENTERING (POSITIONING) STABILITY

After the required warm-up period, the plotted field will maintain its position with respect to the paper web (centering) with an accuracy of $\pm 1/8"$ for periods of at least 50 hours of continuous or intermittent operation. When operated intermittently, additional warm-up may be required after a lengthy shut-down.

*Optional feature. See paragraph 11.0 for details.

TABLE II

PRINTER/PLOTTER INPUT-OUTPUT SIGNAL CHARACTERISTICS

(For Use With Interface Diagram, Figure 9)

INPUT SIGNALS

A. Input Signals to Printer/Plotter from Control UnitCharacter Selection

(6 lines to index character scan beam to one of 64 character positions in character generator)

Six digital-data lines (1, 2, 4, 8, A, B) for 6-bit (parallel) code, plus parity check.
Plus 5-V level indicating binary one; minus 5-V level for binary zero. Tolerance $\pm 20\%$. (Pulsed-code input can be utilized.)
1200-ohm minimum load resistance.

NOTE: These levels should be stabilized prior to receipt of the Character Strobe. (For pulsed-code operation, the pulses should occur in sync with, or preceding, the Character Strobe.)

Selection Parity

(1 line)

(Check Channel "C") Same characteristics as character selection line.

Character Strobe

(1 line to start character writing cycle)

2 microsecond, 6-V ($\pm 10\%$) positive pulse.

Video

(1 line to turn on beam to "print" points and grid lines)

1-V ($\pm 20\%$) positive pulse. (Black)
Minimum width 0.3 microsecond.
Maximum width 255 microseconds.
75-ohm terminating impedance.

Digital Deflection

(10 lines to select cross-web position of printing beam for points, grid lines or characters.)

1024 increments (decimal 0 at the left edge to 1023 at the right). Point printing limited to 1023 increments.
Plus 5-V ($\pm 20\%$) level indicating binary zero.
Minus 5-V ($\pm 20\%$) level indicating binary one.
1000-ohm minimum load resistance.
Binary one represents following deflection from left edge of printing field as units or full scale (1024).
Binary zero = no deflection. All binary ones = full scale deflection.

NOTE: Voltages other than those specified can be accommodated as an optional feature.
See paragraph 11.0 for details.

Line 1 = 1 unit ($1/1024$), 0.0078" for 8" scale

Line 2 = 2 units ($2/1024 = 1/512$)

Line 3 = 4 units ($4/1024 = 1/256$)

Line 4 = 8 units ($8/1024 = 1/128$)

Line 5 = 16 units ($16/1024 = 1/64$), 0.125" for 8" scale

Line 6 = 32 units ($32/1024 = 1/32$), etc.

Line 7 = 64 units ($64/1024 = 1/16$), etc.

Line 8 = 128 units ($128/1024 = 1/8$), etc.

Line 9 = 256 units ($256/1024 = 1/4$), etc.

Line 10 = 512 units ($512/1024 = 1/2$), 4.0" for 8" scale

Deflection Parity Error

(1 line)

Minus 5-V ($\pm 20\%$) baseline, 2 microsecond, 10-V positive pulse to plus 5-V ($\pm 20\%$) indicating a parity error.

75-ohm minimum load resistance.

Horizontal Sweep Gate

(1 line for constant-rate movement of printing beam to the right)

Minus 5-V ($\pm 20\%$) level represents reset beam to the left to position signaled by 10-line digital deflection levels.

Plus 5-V level ($\pm 20\%$) means sweep to the right at a one inch per 30-microseconds rate.

1000-ohm minimum load resistance.

CONTROL LINES

System Ready -

Contact closure when input device and PPCU are ready for operation.

Paper Run -

Contact closure when a start is initiated.

*Paper Cut -

Momentary contact closure operates cut-off knife.

Interlock -

Line jumpered at control unit to cause immediate stop if cable is disconnected or plug is loosened.

B. Printer/Plotter Signals to Control Unit

OUTPUT SIGNALS

Character Reset Strobe

(1 line to reset
strobe for next character cycle)

6-volt negative, 2 microsecond pulse, indicating a digital one.
1200-ohm minimum load resistance at control unit.

CONTROL

(3 lines)

Printer Ready

Contact closure indicating printer ready; open contacts, not ready.

Start Request

Contact closure indicating printer ready and requesting a start; open contacts, normal stop request.

Paper Low

Contact closure when supply is less than 100 ft.

*Standard Speed
Selected

Contact closure indicating paper is moving at a pre-selected speed.

C. Interconnecting Cables and Connectors (Control Unit to Printer/Plotter)

CONTROL

(1 Cable)

Stranded, twisted pair, #22GA, Belden #8749-15 pair; with two connector plugs, AMP Series "M", 26-pin.

SIGNAL

(2 Cables)

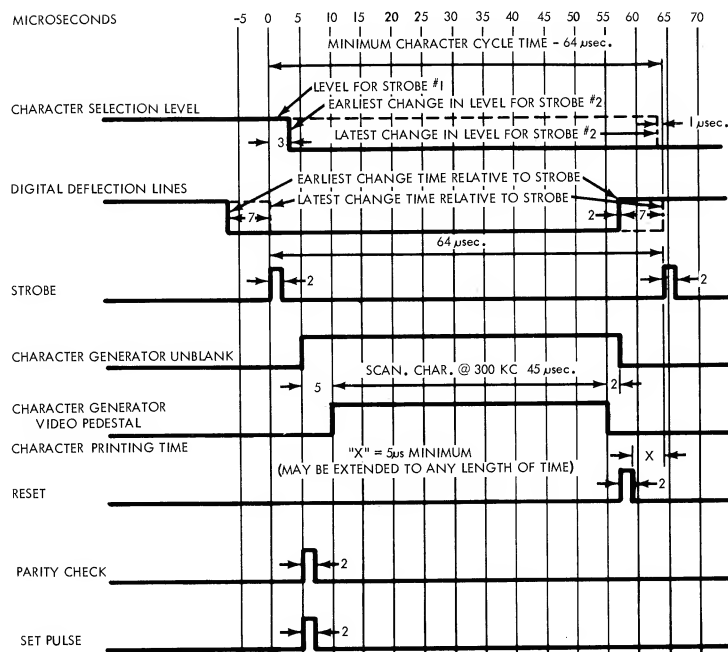
(1) For character selection and Point Video;
10 lines (plus 2 spares), subminax RG-174 μ
(50-ohm);

(1) For printout position (deflection): 12 lines (plus 1 spare), subminax RG-174 μ (50-ohm). Two connector plugs for each cable, AMP Series "M", 20-pin.

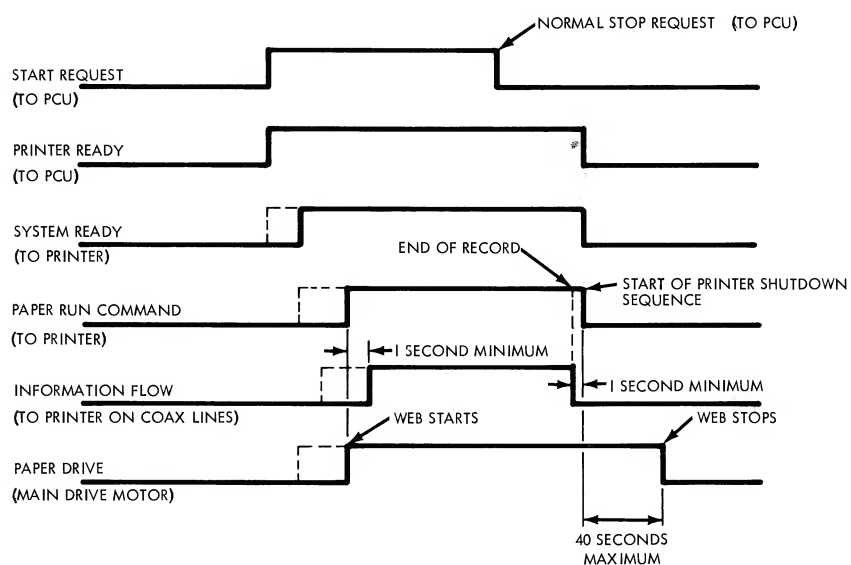
*Optional feature. See paragraph 11.0 for details.

FIGURE 9

INTERFACE DIAGRAM



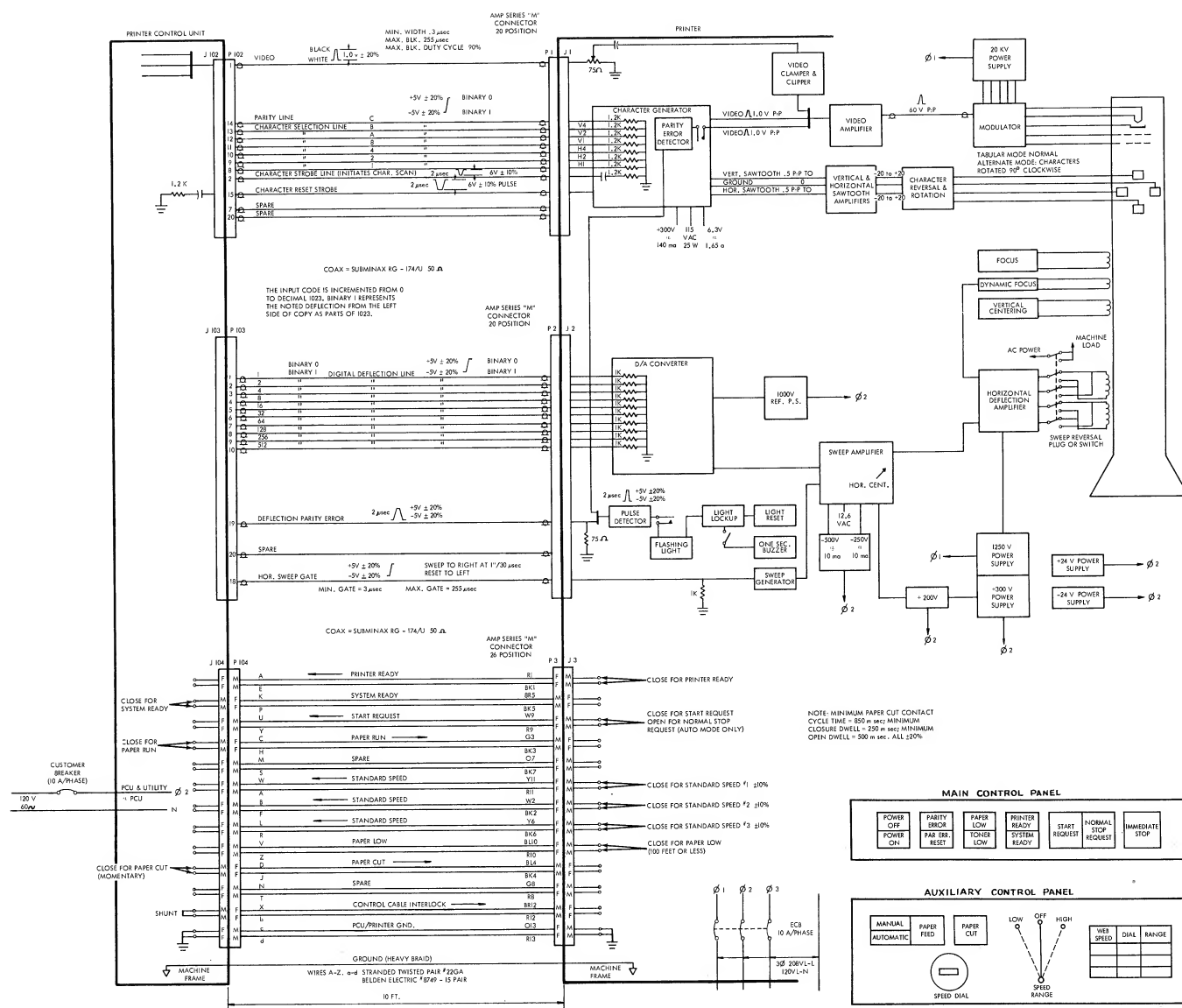
Part I Character Timing



NOTE: When the paper level reaches 20% remaining, a normal stop request is initiated; 10 seconds later, the PRINTER READY and SYSTEM READY levels are lost and the shutdown sequence begins.

Part II Control Timing

FIGURE 9



Part III Interface Diagram

5.5.3 DEFLECTION AMPLITUDE STABILITY

The "printing width" distance (DEFLECTION AMPLITUDE) between the extreme cross-web edges of the plotted field will remain within $\pm 1\%$ of its pre-set value, after the required warm-up period, for periods of at least 50 hours of continuous or intermittent operation. When operated intermittently, additional warm-up may be required after a lengthy shut-down.

5.5.4 HORIZONTAL DEFLECTION LINEARITY

The actual location of plotted points will not deviate from the intended location within the plotted field by more than 1% of the maximum horizontal deflection amplitude. Additionally, a plot of actual location versus intended location will be a smooth curve such that values of all points, located between any two plotted grid lines of 1/2" separation, may be determined by linear interpolation to a minimum accuracy of $\pm 0.1\%$ of full scale.

5.6 CHARACTER GENERATION AND PRINTING

5.6.1 CHARACTER GENERATOR MODEL

A Model 980 Videograph character generator forms an integral part of the Model 9041 Printer/Plotter. This subassembly generates video signals for electrostatic printing of 64 different characters or symbols in response to digital signal input in the manner described in paragraph 4.1. Character height and width controls are provided for adjustment in the field.

5.6.2 ELECTROSTATIC PRINTING TUBE MODEL

An A. B. Dick Videograph Printing Tube with character-writing deflection plates, having a nominal 8-1/2" writing width, is furnished with the printer/plotter.

5.6.3 CHARACTER PRINTING RATE

As installed in the Model 9041 Printer/Plotter, the character generator and electrostatic printing tube are capable of printing alphanumeric data at the rate of 15,625 characters per second, based on a 64-microsecond cycle for selection, printing, and deflection yoke settling time.

5.6.4 PRINTED CHARACTER QUALITY

The printed alphanumeric characters and symbols generated from a typical target, reproduced in Figure 10, are equal to or better than the sample printout attached as Exhibit A.

FIGURE 10

REPRODUCTION OF STANDARD TARGET WITH IBM 7070 CODING

BINARY CODE FOR VERTICAL DEFLECTION TO SELECT ROW	7	1 1 1	H	I	O	.	⌘			
	6	1 1 0	&	A	B	C	D	E	F	G
	5	1 0 1	Q	R	0	\$	*			■
	4	1 0 0	-	J	K	L	M	N	O	P
	3	0 1 1	Y	Z		,	%			
	2	0 1 0		/	S	T	U	V	W	X
	1	0 0 1	8	9	0	#	@			?
	0	0 0 0		1	2	3	4	5	6	7
6 5 4 A. B. DICK CHANNEL NUMBERS		3 2 1	0 0 0 0	0 0 1 1	0 1 0 2	0 1 1 3	1 0 0 4	1 0 1 5	1 1 0 6	1 1 1 7

BINARY CODE FOR HORIZONTAL DEFLECTION TO SELECT COLUMN

7	6	5	4	3	2	1	ABD CHANNEL NUMBERS
Parity	V ₄	V ₂	V ₁	H ₄	H ₂	H ₁	ABD MONOSCOPE CHANNEL NUMBERS
C	B	A	8	4	2	1	IBM CHANNEL NUMBERS

5.6.5 CHARACTER TARGET FORMAT

A target matrix providing up to 64-character or symbol spaces in an 8 x 8 array is utilized in the character generator. A target, similar to that shown in Figure 10, is furnished according to the customers' specification as to selection and arrangement. For targets, the layout data shown in Figure 11 must be used in specifying or designing the target. Spacing is shown in units so artwork may be prepared oversize for photographic reduction to approximately 2-1/2" across the diagonal during target manufacture.

5.6.6 PAGE PRINTING FORMAT

The machine has a flexible format in the tabular mode depending on character input rate and paper speed. (In the tabular mode the base of the character is aligned with and parallel to the web cut-off line.) Optimum legibility is obtained with 10-characters per inch (pica type-writer), 80-characters wide, and a line spacing of 6-lines per inch. At this spacing 3600 lines per minute can be printed at a web speed of 10 inches per second. Character rotation (90°), and character and sweep reversal controls are available to the operator to produce the functions shown on the computer-tape mode copy output (Figure 8).

5.7 OPERATION AND CONTROL

The printer normally operates in the automatic mode as a demand printer commanded by the control unit. Manual mode operation, controlled at the printer, is used only for replacement of the paper supply and developer, and testing. The main and auxiliary control panels are shown in the interface diagram (Figure 9).

Controls for adjusting beam focus, and vertical and horizontal centering of the EPT beam are located in the electronics compartment.

6.0 OPERATING SUPPLIES

6.1 VIDEOGRAPH PAPER

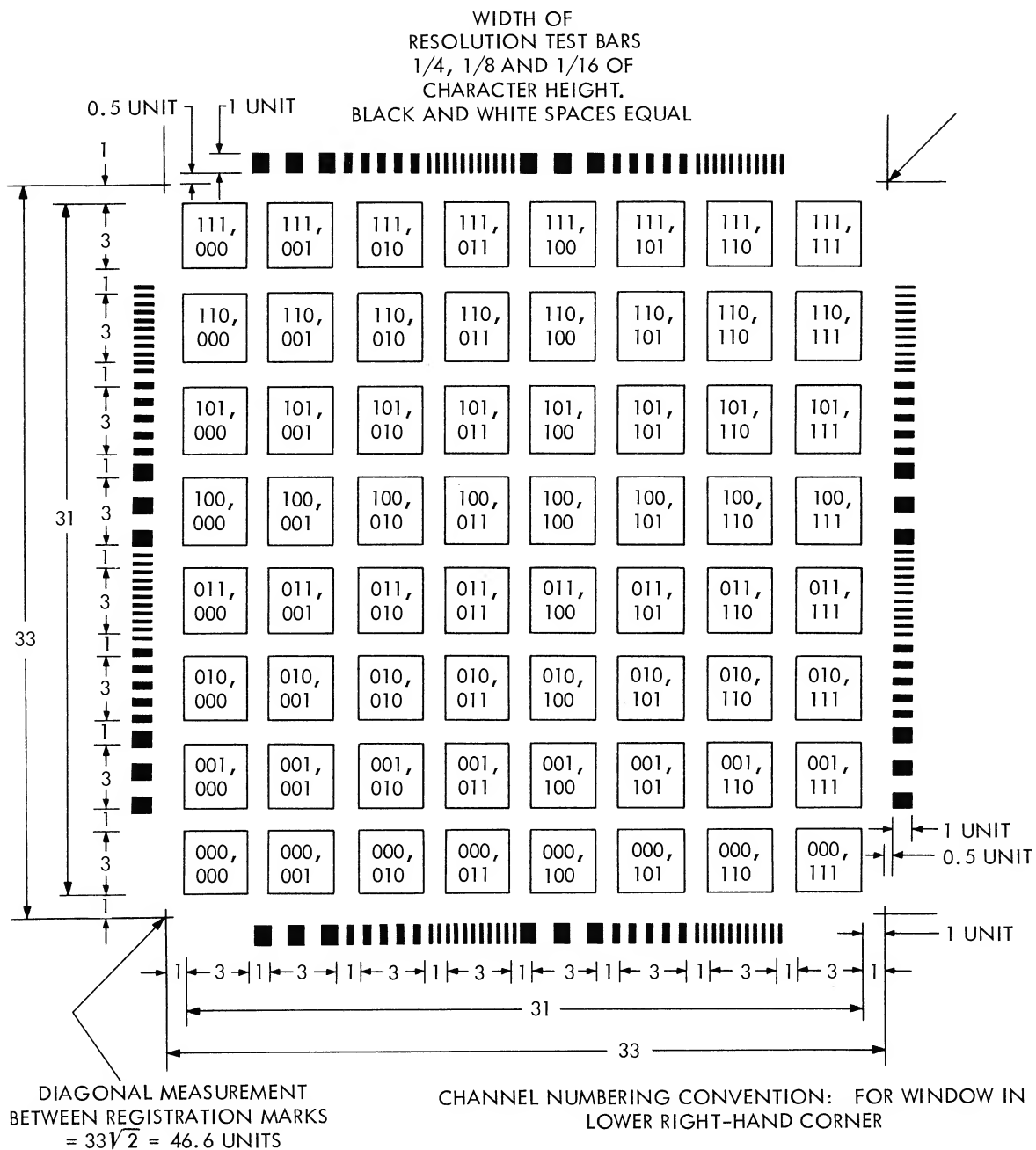
This white paper, coated for Videograph electrostatic printing, is available from A. B. Dick Company in rolls 1460 feet long, 8-1/2" or 11" wide, 10" diameter with a 3" core for spindle mounting. Minimum shelf life in plastic bags is six months in a cool, dry place.

6.2 VIDEOGRAPH LIQUID DEVELOPER

This special toner and carrier is available in one-gallon glass containers for replenishment of the developer supply tank in the base of the printer/plotter.

FIGURE 11

MONOSCOPE TARGET FORMAT AND LAYOUT DATA FOR CHARACTER GENERATOR



0	0	0,	1	1	1	BINARY NOTATION
6	5	4	3	2	1	ABD CHANNEL NUMBERS
V_4	V_2	V_1	H_4	H_2	H_1	ABD MONOSCOPE CHANNEL NUMBERS
B	A	8	4	2	1	IBM CHANNEL NUMBERS

7.0 PHYSICAL DATA FOR INSTALLATION

7.1 CONSTRUCTION, SIZE, AND WEIGHT

Sturdy aluminum frame and dividers with access doors. Approximate over-all dimensions (Figure 12):

Length:	60" (not including 15" receiving tray)
Height:	46" at printing bay; 52" at control panel
Width:	26"
Weight:	1250 pounds (approx.)

7.2 STYLING AND FINISH

Styling is in accordance with best commercial practice with respect to commercial digital computers and peripheral equipment and in conformance with A. B. Dick product design practices. The equipment is finished with baked enamel, A. B. Dick frost green.

7.3 ELECTRICAL REQUIREMENTS

208 V. A.C. $\pm 10\%$, 3 ϕ , 4-wire (1 wire neutral), 30 amp. / ϕ , 60 cps ± 2 cps. Separate direct earth ground one-inch, braided. (See Figure 12)

7.4 HEAT DISSIPATION

Approximately 17,000 BTU per hour, 80 per cent of which is exhausted through the vent.

7.5 ENVIRONMENTAL REQUIREMENTS

As shown in Figure 13.

7.6 VENTING (BY CUSTOMER)

A 6"-diameter vent pipe of corrosion-resistant aluminum with adequate booster fan (approximately 300 CFM, 3/4" static pressure at the exhaust opening of the machine) must be provided by the customer for the purpose of exhausting vapors generated in the printing process. Duct location is shown in Figure 12.

FIGURE 12

VENTING DUCT AND ELECTRICAL RECEPTACLE LOCATIONS

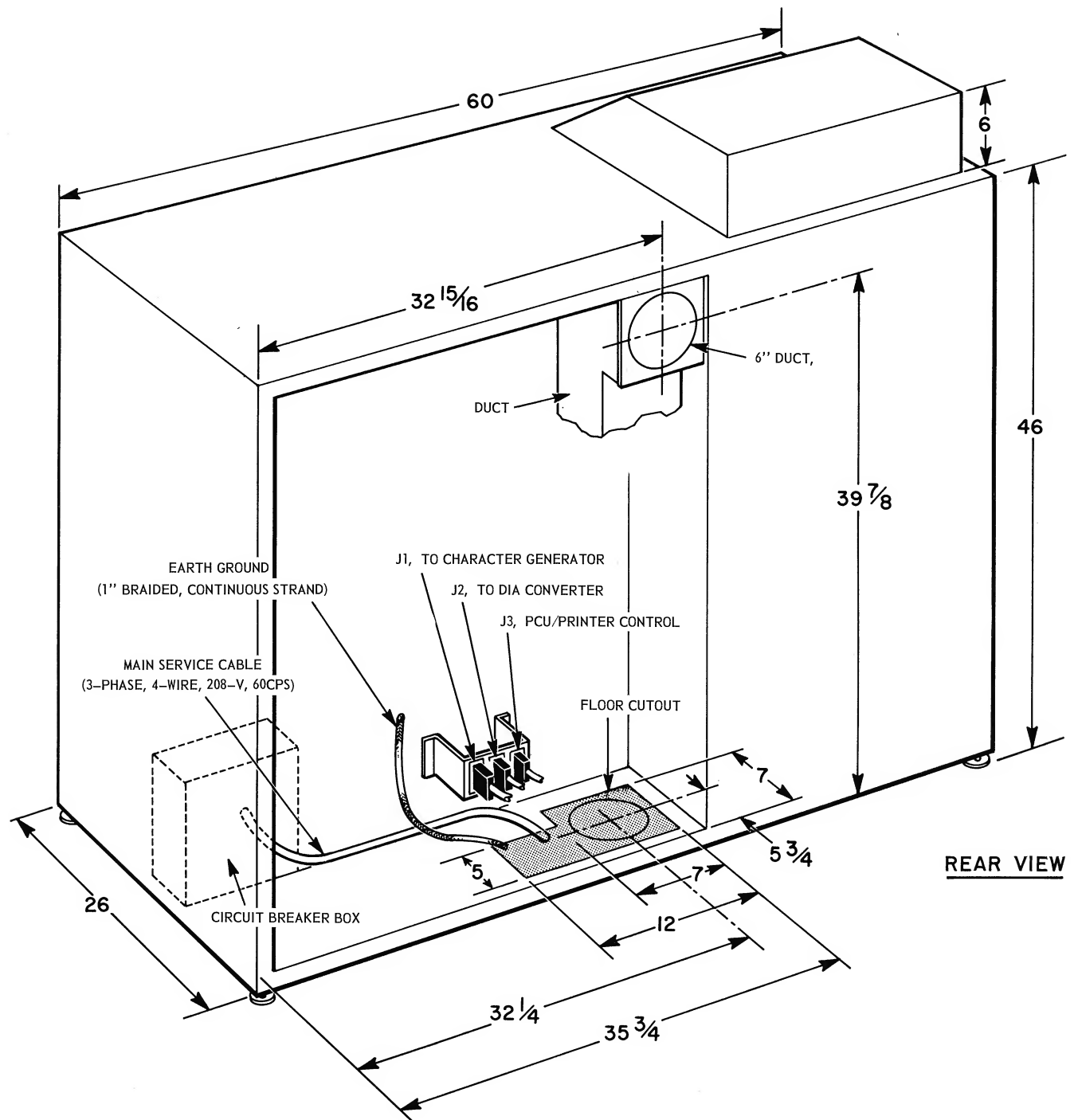
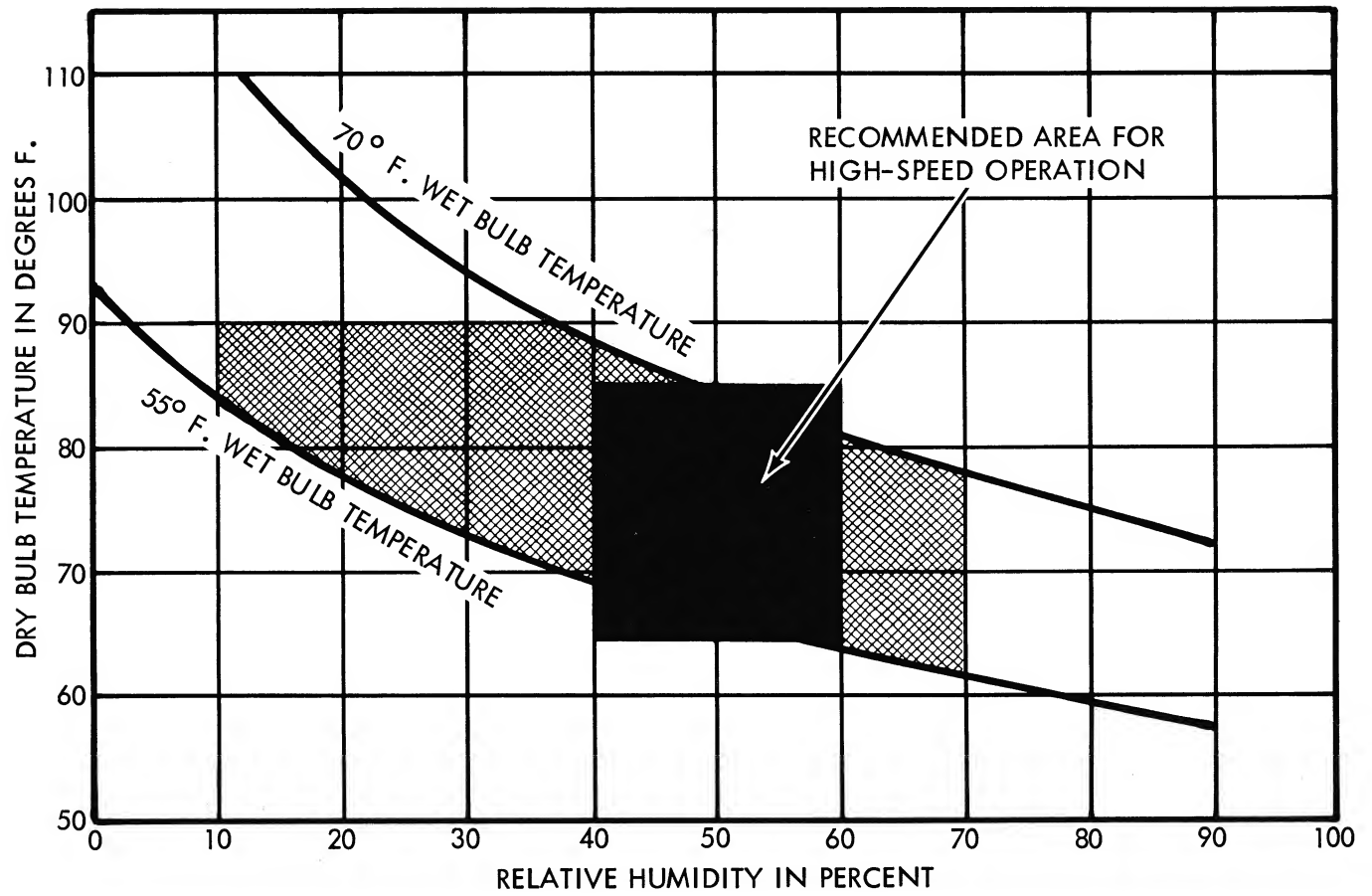


FIGURE 13

VIDEOGRAPH PROCESS ENVIRONMENTAL RANGE



8.0 QUALITY & WORKMANSHIP

Highest quality workmanship and components are used throughout the construction of the Videograph equipment covered by this specification with the objective of providing maximum reliability and minimizing service and maintenance.

9.0 TECHNICAL INFORMATION

Three copies each of tabular parts lists and operating and maintenance manuals including complete wiring diagrams, circuit board schematics, etc. will be furnished with each of the equipments covered by this specification.

10.0 WARRANTY

A. B. Dick Company covenants with and warrants unto the purchaser that the equipment shall be manufactured of first quality new materials and by skilled workmanship and shall be free from defects in material and workmanship. This warranty shall extend for a period of one (1) year from the date of installation of the equipment by A. B. Dick Company on purchaser's premises, except expendable parts such as rollers, punches, knives and combs and except electronic components manufactured by others than A. B. Dick Company including electron and electrostatic tubes which shall be warranted free from defects for such period as may be extended to A. B. Dick Company by the manufacturer of such components.

11.0 OPTIONAL EXTRAS (Added Cost Features)

The features listed below may be selected for inclusion in the Model 9041 Printer/Plotter if provided for in the equipment order and upon payment of the additional costs for the options selected.

<u>OPTION NUMBER</u>	<u>DESCRIPTION</u>
1	Web cut-off from a remote, manual control station.
2	Automatic web cut-off from programmed signals to the control unit.
3	Signal (s) from printer/plotter to indicate paper is moving at pre-selected speed (s).
4	Choice of other input signal voltages. (Requires circuit modification.)
5	Special color, baked enamel finish.
6	Fixed message imprinter (security classification or other).

OPTION NUMBER

DESCRIPTION

- | | |
|---|---|
| 7 | Character rotation selection from a remote control. |
| 8 | Signal simulator for maintenance. |

